LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY (LDEQ)
OFFICE OF ENVIRONMENTAL SERVICES

STATEMENT OF BASIS

St. Charles Operations
TV Permit for Olefins Distribution/Site Logistics Units
Union Carbide Corporation
Taft, St. Charles Parish, Louisiana
Agency Interest No. 2083
Activity Number PER19960023
Draft Permit 2656-V0

I. APPLICANT:

Company:
Union Carbide Corporation.
P. O. Box 50, Hahnville, LA 70057

Facility:
St. Charles Operations, Olefins Distribution & Site Logistics Units
355 Hwy. 3142 Gate 28, Approximately 2 miles west of Hahnville, on the west bank of the Mississippi River, off LA Highway 3142 at corner of LA Hwy 18
Approximate UTM coordinates are 746.184 km East and 3,319.222 km North, Zone 15.

II. FACILITY AND CURRENT PERMIT STATUS:

Union Carbide Corporation, a subsidiary of the Dow Chemical Company, owns and operates a chemical manufacturing facility in St. Charles Parish near Taft. The St. Charles Operations (SCO) is an integrated petrochemical manufacturing complex, converting petroleum-based raw materials into a variety of basic building block, intermediate chemicals and plastics. The products from this facility eventually wind-up in thousands of everyday household, business, and consumer products. The facility as a whole started operation before 1969.

Site Logistics is responsible for the bulk storage, loading and unloading of many of the products and raw materials associated with the SCO. HCD Olefins Distribution Unit provides support for both the Olefins 1 and 2 Units. It is comprised of 17 feed and product storage vessels.
Currently, Site Logistics is operating under Permit No. 2719-V0 issued May 22, 2001, and the HCD Olefins Distribution Unit is operating under Olefins I and II Permit Nos. 2422 (M-1), dated October 12, 1999, and 2656 (M2) dated March 25, 2003.. All these permits will be included in this TV Permit.

Many sources at the facility had "grandfathered" status until the promulgation of the "Part 70" program within Louisiana. The facility submitted timely applications for initial Part 70
Permits and continues to operate pursuant to the "application shield" provided in the program.

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In addition, the facility has several state permits that will remain effective until replaced by a Part 70 permit. These include:

Permit #	Units or Sources	Date Issued
477 (M-1)	Unit 5 (Amines I)	4/25/1990
2446	Unit 8	12/5/1996
2214	LP-6	5/2/2000
476C (M-3)	Oxide II	1/8/2001
2656 (M-2)	Olefins Distribution Unit	3/25/2003

Several Part 70 permits addressing portions of the facility have already been issued. These include:

Permit #	Units or Sources	Date Issued
2257-V2	TB 1 & 2	11/14/1997 *
1909-V0	Polyglycols	10/21/1998 *
2520-00012-V0	Polypropylene Cypress Plant	8/10/1999
2689-V0	General Permit (Tank, TB1 & 2)	8/9/2000
2719-V0	Site Logistics	5/22/2001*
2751-V0	General Permit (Tank, Site Logistics)	10/13/2001
513-V1	Acrylics I	1/15/2002 *
2799-V0	General Permit (Flare, Unit8)	3/28/2002
2814-V0	Methyl Glycol Ethers (MGE)	10/31/2002
1912-V0	Specialty Products Unit	3/12/2003
2841-V0	General Permit, (Tank, Unit 5 (Amines I))	4/17/2003
898-V0	Unit 6 (Ethylene Amines II)	7/3/03
2864-V0	General Permit, (Tank, Unit 5 (Amines I))	9/4/2003
2847-V0	ASU	9/18/2003
2350-V3	LP-3 Unit	12/30/2003
2876-V0	Unit 9	6/7/2004
2858-V0	PXC Unit	7/8/2004
2104-V0	Environmental Protection Dep. (EPD)	8/11/04
2422-V1	Olefins I & II	9/30/2004
476-V0	Oxide I	3/7/05

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Permit #	Units or Sources	Date Issued
2343-V0	Energy Systems	6/27/05
1082-V0	Maintenance and General Facilities	9/10/05
2421-V0	Amines Plants	11/10/05

* Renewal application submitted

Finally, several applications for initial Part 70 permits addressing the remaining portions of the facility are still under review by the department. These include:

Permit #	Units or Sources
Grandfathered	Acrylics 2
Grandfathered	AP-2
Grandfathered	DAP

III. PROPOSED PERMIT / PROJECT INFORMATION:

Proposed Permit

A permit application and Emission Inventory Questionnaire was submitted by Union Carbide Corp on October 12, 1996 requesting an Initial Part 70 operating permit for HCD Olefins Distribution Unit; an updated application was submitted on August 6, 2002. On October 13, 2004 a revised application was submitted requesting a modification to the Site Logistics TV Permit as well as the incorporation of the Olefins Distribution Unit. On March 25, 2005 an additional revision was submitted requesting a renewal with the modification to the Site Logistics TV Permit, and the inclusion of the initial TV permit for Olefins Distribution Unit. Additional information was also submitted March 17, 21, 23, April 20, June 8, and August 24, September 19, October 11 and November 18, 2005, and January 10, 2006..

Project description

UCC requests the following changes as well as the reconciliation of emissions from change in methodology due to better process knowledge and conservative estimates.

- The consolidation of the Initial Title V for HCD Olefins Distribution Unit with the Title V renewal for Site Logistics.
- The addition of the Acrylate Enclosed Flare, Emission Point (EP) 3414, to capture Acrylate emissions. This point will replace both the Field Acrylate Scrubber (EP 3404) and the

Overland Acrylate Scrubber (EP 3405). This point will also capture emissions from the marine loading of Acrylates previously captured by the No. 3 Dock Scrubber for Amines (EP 3409).

- The addition of MEA Tank 1230 (EP 3415).
- The addition of DEDA Tank 2326 (EP 3420).
- The addition of the new Tank / Truck Rack (EP 3426). This loading rack will replace the existing rack Emission Point 615.
- The addition a new Acetic Acid Tank, Tank 2200A (EP 3419).
- The incorporation of the Vinyl Acetate Monomer Tanks (Tanks SL-A & SL-B) from the Unit 9 Permit No. 2876-V0.
- The creation of the SL Transfer Operations CAP (EP 3400) to provide operational flexibility for loading activities.
- A modification to the Ethylene Oxide Flare (EP 507) and the No. 1 Dock Enclosed Flare (EP 668) emissions calculation methodologies.
- The deletion of the following emission sources:
    - Waste Water Tanks 2520, 2521, and 2522 (EPs 590, 591 and 592) respectively,
    - Drum Loading (EP 609),
    - Tank 2201 (EP 530),
    - Tank 2323 (EP 665).
- The reconciliation of Tank and Loading Calculations. This reconciliation includes updated stream speciation, annual throughputs, max pump rates, tank colors, and revised scrubber efficiencies. This alters the regulatory applicability for some storage tanks (e.g., SOCMI HON previously applicable; is no longer applicable).
- The reconciliation of the Packed Column Scrubber (EP 3413).
- The fuel gas feed rate for the Ethylene Oxide Flare (EP 507) was increased to meet the required heating value from the current permit.
- An update to the max hourly rates to better reflect operating conditions for the Oxide Flare EP 507, and the No. 1 Dock Enclosed Flare EP 668, as well as 36 tanks.

Section 6 of the Permit Application, dated October 15, 2004 lists the permitted emission rate before and after the updates (in tons per year) for each emission point in the permit. These changes are summarized in the Permitted Air Emissions Section, which follows.

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Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	4.5	4.34	- 0.16
SO_2	4.2	3.44	- 0.76
NO_X	65.3	59.69	- 5.61
CO	21.7	48.91	+ 27.21
VOC *	239.37	329.68	+ 90.31
Ammonia	1.3	0.29	
Hydrogen Sulfide	-	0.08	

VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Acetaldehyde	0.18	0.82	+0.64
Acrolein	-	<0.01	+ <0.01
Acrylic Acid	3.3	5.80	+2.50
Benzene	2.15	13.77	+11.62
Biphenyl	0.004	<0.01	+ <0.01
1,3-Butadiene	2.20	6.40	+4.20
n-Butanol (n-Butyl Alcohol)	17.3	8.28	-9.02
Cumene	0.007	<0.01	+ <0.01
Diethanolamine	1.2	0.15	-1.05
Diethylene Ether (1,4-Dioxane)	0.002	0.04	+0.038
Ethyl Acrylate	4.3	2.72	-1.58
Ethylbenzene	0.063	0.10	+.037
Ethylene Dichloride (1,2-Dichloroethane)	3.0	6.81	+3.81

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VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Ethylene Glycol	6.3	3.26	-3.04
Ethylene Oxide	0.54	9.21	+8.67
Formaldehyde	-	<0.01	+ <0.01
Glycol Ethers (II-S)	3.7	2.82	-0.88
Glycol Ethers (II)	5.5	0.64	-4.86
n-Hexane	7.03	16.47	+9.44
Hydroquinone	Neg.	<0.01	+ <0.01
Methanol	0.63	0.72	+0.09
MEK	<0.01	<0.01	-
Naphthalene	0.17	0.10	-0.07
PAHs	<0.01	<0.01	-
Phenol	-	<0.01	+ <0.01
Phthalic Anhydride	-	<0.01	+ <0.01
Styrene	0.18	0.28	+0.10
Toluene	1.25	2.40	+1.15
2,2,4-Trimethylpentane	0.092	0.21	+0.118
Vinyl Acetate	-	<0.01	+ <0.01
Vinyl Chloride	-	<0.01	+ <0.01
Xylenes	0.29	0.50	+0.21
TOTAL	**59.388**	**81.50**	**22.112**

Other VOC (TPY): 248.18

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Prevention of Significant Deterioration Applicability

There are several projects included in this permit as follows. The Olefins Distribution Unit has the Naphtha service for three tanks, EP (516, 5178, and 600). The Site Logistics has the new T/T Loading Rack, EP 3416, new Acrylates Flare, EP 3414, the addition of three tanks, EP (3415, 3419, 3420) and two water pumps, EP (3417 and 3418).

Olefins Distribution Project		
Emission Point	Project Increases	PSD Trigger
516	8.38	
518	8.35	
600	8.38	
TOTAL	**25.11**	**40**

Site Logistics Project		
Emission Point	Project Increases	PSD Trigger
3416	21.32 [a]	
3414	4.72	
3415	1.15	
3417	0.61	
3418	0.45	
3420	1.94	
3419	(b)	
TOTAL	**30.19**	**40**

(a) Emissions from this loading rack are included in Loading CAP 3400. This is the CAP limit.
(b) Emissions from this tank go to Acrylate Enclosed Flare, Emission Point 3414.

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MACT Requirements

This unit does need to comply with State MACT standards. Class I and II pollutants, regulated under LAC 33:III Chapter 51, are emitted.

UCC meets MACT requirement for the Site Logistics and Olefins Distribution Units. All applicable requirements are provided in the Facility Specific Requirements Section of the draft permit.

Air Modeling Analysis

Impact on air quality due to emissions from this unit is below the National Ambient Air Quality Standards (NAAQS). Ambient Air Standards (AAS) dispersion modeling was required for Ethylene Oxide, n-Hexane, Vinyl Chloride and Acrylic Acid. The Dispersion Model used was (ISCST3 Version 02035).

Union Carbide's dispersion modeling results predict the ambient concentration of the pollutants Ethylene Oxide, n-Hexane and Vinyl Chloride to be below the corresponding requirements for the Ambient Air Standard (AAS) provided in LAC 33:III.Chapter 51 Table 51.2.

To determine compliance with the Louisiana Ambient Air Standards (AAS) for acrylic acid, permittee shall establish ambient monitoring for this pollutant in accordance with a monitoring plan and operating procedures to be approved by the Office of Environmental Assessment. The monitoring plan and operating procedures shall be submitted within 45 days of the permit issuance, and the monitoring should commence as soon as practical but no later than 90 days from the date of permit issuance. Monitoring sites should be based upon consideration of the maximum off site concentrations as predicted by dispersion modeling of Union Carbide's permitted emissions alone and of permitted emissions from all sources in the Union Carbide Area of Inclusion (AOI). If monitoring indicates off-site levels of acrylic acid above the AAS, further remedial action will be required to achieve compliance with the ambient air standards; permittee shall submit an application for permit modification within 60 days after completion of monitoring.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

IV. Regulatory Analysis

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit.

V. Specific Conditions Determination

There are several specific conditions limiting emissions from loading. The limits are provided under SL Loading Cap, Emission Point 3400. The units will keep precise records of any material loaded, the quantity, as well as the emissions generated. Additionally, the units will keep a monthly as well as a twelve month rolling average record of the total emissions. These specific conditions will allow the units the necessary flexibility to load certain materials from any rack at the units.

VI. Periodic Monitoring

The following periodic monitoring is done at the facility:

- Loading throughputs will be monitored as required by the SL Loading CAP.
- This unit is included in the Louisiana Fugitive Emissions Program Consolidation. Union Carbide conducts fugitive emissions monitoring in accordance with the specific

conditions of this program (see Specific Requirement Section of draft permit). Compliance with these specific conditions shall serve to comply with each of the several programs being streamlined. The overall most stringent program for Oxide 1 Unit is 40 CFR 63 Subpart H (HON).

- To determine compliance with the Louisiana Ambient Air Standards (AAS) for acrylic acid, permittee shall establish ambient monitoring for this pollutant in accordance with a monitoring plan and operating procedures to be approved by the Office of Environmental Assessment. The monitoring plan and operating procedures shall be submitted within 45 days of the permit issuance, and the monitoring should commence as soon as practical but no later than 90 days from the date of permit issuance. Monitoring sites should be based upon consideration of the maximum off site concentrations as predicted by dispersion modeling of Union Carbide's permitted emissions alone and of permitted emissions from all sources in the Union Carbide Area of Inclusion (AOI). If monitoring indicates off-site levels of acrylic acid above the AAS, further remedial action will be required to achieve compliance with the ambient air standards; permittee shall submit an application for permit modification within 60 days after completion of monitoring.

VII. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H_2S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

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Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Selective Catlaytic Reduction (SCR) – A noncombustion control technology that destroys NO_X by injecting a reducing agent (e.g., ammonia) into the flue gas that, in the presence of a catalyst (e.g., vanadium, titanium, or zeolite), converts NO_X into molecular nitrogen and water.

Sulfur Dioxide (SO_2) – An oxide of sulphur.

TAP - Toxic Air Pollutant (LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3

Title V permit – See Part 70 Operating Permit.

"Top Down" approach – An approach which requires use of the most stringent control technology found to be technically feasible and appropriate based on environmental, energy, economic, and cost impacts.

Turbine – A rotary engine in which the kinetic energy of a moving fluid is converted into mechanical energy by causing a bladed rotor to rotate.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.